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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/243,101	02/02/1999	JOSHUA B. SUSSER	08993/007001	2006

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EXAMINER	
VU, TUAN A	
ART UNIT	**PAPER NUMBER**
2124	26

DATE MAILED: 05/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/243,101	SUSSER ET AL.	
	Examiner	Art Unit	
	Tuan A Vu	2124	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *59-150* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *59-150* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 February 1999* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *25*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is responsive to the Applicant's response filed 3/11/2004.

As indicated in Applicant's response, no claims have been amended. Claims 59-150 are pending in the office action.

The affidavit under 37 CFR 1.132 filed 3/11/2004 is sufficient to overcome the rejection of claims 59-150 based upon "Java Virtual Machine Specification Version 2.1" by Sun Microsystems, 1999.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.
>
> Note: 35 U.S.C. § 102(e), as revised by the AIPA and H.R. 2215, applies to all qualifying references, except when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. For such patents, the prior art date is determined under 35 U.S.C. § 102(e) as it existed prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. § 102(e)).

3. Claims 59-61, 63-69, 71-79, 81-87, 89-95, 97, 99-101, 103-115, 117-129, 131-143, and 145-150 are rejected under 35 U.S.C. 102(e) as being anticipated by Wilkinson et al., USPN: 6,308,317 (hereinafter Wilkinson).

As per claim 59, Wilkinson discloses an application software program comprising an object-oriented, verifiable, type-safe and pointer-safe sequence of

instructions, said instructions comprising codes and operands (e.g. Fig. 5, 12, 18 – Note: stack parameters checking is equivalent to type and reference safe checking prior to instructions execution) residing on a computer-readable medium (*Loadable application A, B*, Fig. 14);

wherein the program can be loaded to and executed (*Loading and Execution control 120*, Fig. 14) by a *Integrated Circuit Card*, i.e. resource-constrained device as claimed (hereinafter RCD),

said instructions previously converted from one class file (e.g. col. 10, lines 30-47; Fig. 5,6);

said conversion transforming one reference to a constant pool to inline data in said instructions (e.g. *V ref* 91, data *FFF3* – Fig. 9)

that is based on a processor architecture of fewer than 32 bits (Fig. 1, 13; col. 7, lines 43-56).

As per claim 60, see Wilkinson: Fig. 9 (re claim 59)

As per claim 61, see Wilkinson: Fig. 9 (Note: inlining data into instructions or operands of instructions is implicitly disclosed in Fig. 9).

As per claim 63, see Wilkinson: col. 7, lines 43-56.

As per claim 64, Wilkinson discloses a resource-constrained device having RAM of no more than 64Kbytes (Fig. 1; col. 7, lines 43-56).

As per claim 65, Wilkinson further discloses the RCD having RAM of no more than 4Kbytes (col. 7, lines 43-56).

As per claim 66, Wilkinson further discloses a Java card virtual machine (*Card JVM 16*, Fig. 1), a VM residing on a microprocessor of the RCD.

As per claim 67, see Wilkinson: *Card JVM 16*, Fig. 1; col. 1, lines 16-19.

As per claim 68, see Wilkinson: *integrated circuit* - col. 3, lines 17-24, 51-58; Fig. 1, 21 (note: circuit built for specific application, e.g. Fig. 22, as smartcard implies an application specific IC)

As per claim 69, this claim recites the same limitations as claim 59 which Wilkinson has met as per rejection in claim 59. Further, Wilkinson further discloses that said converted instructions comprise at least one composite instruction for performing an operation on a current object (ILOAD_0, ILOAD_1 – Fig. 7; ILOAD_B – Fig. 11 Note: instructions embedding operands and data which can be decomposed into separate parts of the instructions to be executed are equivalent to composite instructions).

As per claims 71-76, refer to corresponding rejections of claim 63-68, respectively.

As per claim 77, Wilkinson discloses a resource-constrained device (Fig. 2) comprising:

a memory for storing (e.g. *Card ROM 140* -- Fig. 14) an application program comprising an object-oriented, verifiable, type-safe and pointer-safe sequence of instructions, said instructions comprising codes and operands (e.g. Fig. 5, 12, 18);

said instructions previously converted from one class file (e.g. col. 10, lines 30-47; Fig. 5,6);

said conversion transforming one reference to a constant pool to inline data in said instructions (e.g. *V ref* 91, data *FFF3* – Fig. 9); and

a virtual machine implemented on a microprocessor (col. 1, lines 16-34; Fig. 1,18) wherein the virtual machine is capable of executing the sequence of instructions (*Loading and Execution control 120*, Fig. 14).

As per claims 78-79, 81-85, refer to corresponding rejections of claim 60-61, 63-68, respectively.

As per claim 86, Wilkinson discloses Java Card technology (col. 7, lines 42-55; *Java card* --col. 8, lines 41-50; Fig. 3).

As per claim 87, this claim includes the same limitations as in claim 69 and claim 74; hence is rejected using the corresponding rejections as set forth therein.

As per claims 89-94, these claims are rejected with the corresponding rejections as set forth in claims 63-65, 67-68, and 86, respectively.

As per claim 95, Wilkinson discloses a method for using an application software program including an object-oriented, verifiable, type-safe and pointer-safe sequence of instructions (e.g. Fig. 5, 12, 18), the method comprising:

receiving (*Integrated Circuit Card 10*, Fig. 2) the software program in a resource-constrained device (RCD) having a memory (Fig. 14; col. 7, lines 43-56; said instructions previously converted from one class file (e.g. col. 10, lines 30-47; Fig. 5,6);

said conversion transforming one reference to a constant pool to inline data in said instructions (e.g. *V ref* 91, data *FFF3* – Fig. 9); and

executing the sequence of instructions on the RCD (*Loading and Execution control 120*, Fig. 14; Fig .18).

As per claim 97, Wilkinson further discloses storing the sequence of instructions on the RCD (e.g. *Card ROM 140* -- Fig. 14).

As per claim 99, Wilkinson further discloses transforming constant pool indices in the received set of instructions to corresponding data values (col. 9, lines 25-41; Fig 9; col. 9, line 64 to col. 10, line 10).

As per claims 100-101, 103-108, refer to corresponding rejections of claims 60-61, 63-68, respectively.

As per claim 109, this claim incorporates the limitations of claim 95; and is rejected with the corresponding rejections as set forth in claim 95; and further comprises the limitation of comprising at least one composite instruction. However, this limitation has been addressed in claims 69 or 87.

As per claims 110-115, 117-122, refer to corresponding rejections of claims 96-101, 103-108, respectively.

As per claim 123, this is the apparatus claim corresponding to claim 95 above; and is rejected using the corresponding rejections as set forth therein.

As per claims 124-129, 131-136, refer to corresponding rejections of claims 96-101, 103-108, respectively.

As per claim 137, this is the apparatus claim corresponding to claim 109 above; and is rejected using the corresponding rejections as set forth therein.

As per claims 138-143, 145-150, refer to corresponding rejections of claims 96-101, 103-108, respectively.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 62, 70, 80, 88, 96, 98, 102, 116, 130, and 144 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilkinson et al., USPN: 6,308,317, as applied to claims 59, 69, 77, 87, 95, 109, 123 and 137 above.

As per claim 62, Wilkinson does not specify that such the RCD is an 16-bit processor architecture for executing the instructions even though Wilkinson suggests the possibility of operating with 8,16 or 32-bit microprocessor (col. 1, line 61 to col. 2, line 2) and operation in the RCD being performed on 16-bit integers (col. 9, lines 29-41). One of ordinary skill in the art at the time of the invention would recognize the need for implementing a architecture so that the instruction architecture can be handle either 8, 16 or 32 bit instruction architecture as suggested by Wilkinson. Official notice is taken that implementing 8, 16, or 32 bit type processor architecture was a well-known concept in the art of building processors or embedded processors and that micro-controllers use was in great demand for resources-restraint devices at the time the invention was made. Hence, it would have been obvious for an ordinary skill in the art at the time of the invention was made, to implement a RCD or embedded processor based on an 16-bit architecture capability and apply that architecture to Wilkinson's small device (RCD) processor or micro-controller system because that would enable the RCD to perform more advanced, larger numerical data-intensive, e.g. 16-bit integer or floating point arithmetic or complicated type of instructions in the software applications needed in today's technology and also to ensure the cross-platform portability of the product of the time where processor architecture capable of handling larger bus size is becoming a

standard in the internet as mentioned by the official notice and the suggested teachings by Wilkinson.

As per claim 70, refer to rationale of rejection in claim 62 above.

As per claim 80, refer to rationale of rejection in claim 62.

As per claim 88, refer to rationale of rejection in claim 62.

As per claims 96 and 98, Wilkinson further suggests retrieving security-related data over a communication network and the Internet (col. 3, lines 40-46); and discloses downloading of software onto the RDC (Fig. 1, 2; col. 3, line 60 to col. 4, line 8; col. 7, line 66 to col. 8, line 8); **but does not explicitly teach** accessing the software program to download onto the RDC from the a network (re claim 96) or Internet (re claim 98). Official notice is taken that accessing, retrieving, storing, and distributing software and application data over a network or Internet is a well-known concept in computer communication and networking. Thus, it would have been obvious for one of ordinary skill in the art at the time the invention was made to add to Wilkinson's system the accessing of application programs over the Internet or network because this would improve the availability of program to load the RCD while enhancing the resource usage efficiency for not overburdening the storage of the host machine and the RCD connected to it.

As per claim 102, refer to rationale of rejection in claim 62.

As per claim 116, refer to rationale of rejection in claim 62.

As per claim 130, refer to rationale of rejection in claim 62.

As per claim 144, refer to rationale of rejection in claim 62.

Response to Arguments

6. Applicant's arguments filed 5/28/2003 (response to the first Office Action filed around 1/23/03) and addressing the subject matter of the prior art herein applied have been fully considered but they are not persuasive. Following are the reasons.

Applicants have submitted that Wilkinson teaches a proposed solution that is to map the strings in the Class File pool into integers or renumbering byte codes for optimizing type tests (Appl. Rmrks, pg. 18); and that is different from the limitations of, say claim 59. In response, it is noted that the conversion from a constant pool references via the use of Class file constructs as taught by Wilkinson and specified in the rejection does read on conversion transforming at least one reference to a constant pool to inline data in the instructions. The limitation that 'the sequence of instructions were previously converted from at least one class file' and the limitation that the 'application software program comprises a sequence of instructions' has no real time differential effect as to make it distinct from what Wilkinson discloses. In other words, the conversion from the class file into instructions is one step described by Wilkinson as transforming a reference to a constant pool into some data inlined among other parts within an instruction word allotted in memory. All such instructions are then part of such runtime program, the conversion being prior to such instructions being re-arranged as they would be loaded for execution. Hence, Wilkinson not only teaches the conversion into inlined data in the instructions, but also teaches a conversion from some class file prior to the converted instructions being included in the loaded program for execution. Besides, the technique of inlining of data into instructions is a well-known technique for optimizing processor's resources like runtime memory in small devices. Such teaching is exemplified here with Wilkinson's approach to help micro-controller to husband their limited resources which

would be less limited had it been a regular processor like those known in full size PC. And such has been the optimizing method taught by Wilkinson, and it appears that the invention is doing the same thing. Besides, the claim does not specify how exactly such 'converted from ... one class file' is, nor does it describe such 'transforming ... to inline data ...' is specifically so to distinguish it from what Wilkinson does to the reference to a constant pool. Examiner has used the most reasonable and broadest approach to interpret what is claimed and has taken that into consideration when mapping Wilkinson's teachings to the recited limitations. At the same time, Examiner has considered the similarity in functionality of the subject matter, not on difference in terminology.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Pub. No. 2003/0023954 to Wilkinson et al., disclosing appendix with code to optimize the smart card instructions.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan A Vu whose telephone number is (703)305-7207. The examiner can normally be reached on 8AM-4:30PM/Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on (703)305-9662.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9306 (for formal communications intended for entry)

or: (703) 746-8734 (for informal or draft communications, please consult Examiner before using this number)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington. VA. , 22202. 4th Floor(Receptionist).

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

VAT
May 15, 2004

TODD INGBERG
PRIMARY EXAMINER